

WHAT IS CLAIMED IS:

Sub 02
1. A method for producing a dental positioning appliance which is removably attachable to at least one dental feature to effect or enhance dental positioning, said method comprising:
providing a mold of dental features wherein the mold has at least one attachment device mounted or formed on a surface of the mold;
forming the dental appliance over the mold with the attachment device;
and
removing the dental appliance from the mold, wherein the appliance has a receptacle corresponding to the attachment device and tooth receiving cavities corresponding to the dental features of the mold.

2. A method as in claim 1, wherein the method further comprises:
providing additional structures on the mold of dental features, wherein the appliance has protrusions corresponding to the structures; and
removing the appliance from the mold utilizing the protrusions, whereby removal is aided.

3. A method as in claim 1, wherein the method further comprises:
providing additional structures in the mold of dental features, wherein the structures provide a guide to demarcate a portion of the appliance in a desired location;
and
altering a portion of the appliance demarcated by the structure.

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4. A method as in claim 3, wherein the altering step comprises cutting out the portion of the appliance demarcated by the structure, whereby a window is created to expose the underlying dental feature.

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5. A method for producing a digital model, said method comprising:
providing a digital model of at least one dental feature;
providing a digital model of at least one attachment device; and
positioning the digital model of the attachment device on the digital model of the dental feature to produce a combined computerized model.

1 ~~5~~ 6. A method for producing a dental positioning appliance which is
2 removably attachable to at least one dental feature to effect or enhance dental positioning,
3 said method comprising:

4 providing a combined digital model of at least one dental feature having at
5 least one attachment device;

6 producing a mold from the combined digital model, wherein the mold has
7 the attachment device on a surface thereof;

8 forming a dental positioning appliance over the mold; and

9 removing the appliance from the mold, wherein the appliance has a
10 receptacle corresponding to the attachment device and cavities corresponding to the
11 dental features.

1 ~~6~~ 7. A method as in claim ~~5~~ 6, wherein the method further comprises:
2 providing a digital model of an additional structure;

3 positioning the digital model of the additional structure on the digital
4 model of dental features, wherein the appliance has protrusions corresponding to the
5 structures; and

6 removing the appliance from the mold utilizing the protrusions, whereby
7 removal is aided.

1 ~~7~~ 8. A method as in claim ~~5~~ 7, wherein the method further comprises:
2 providing a digital model of an additional structure;

3 positioning the digital model of the additional structure on the digital

4 model of dental features, wherein the structures provide a guide to demarcate a portion of
5 the appliance in a desired location; and

6 altering a portion of the appliance demarcated by the structure.

1 ~~8~~ 9. A method as in claim ~~7~~ 8, wherein the altering step comprises cutting
2 out the portion of the appliance demarcated by the structure, whereby a window is created
3 to expose the underlying dental feature.

1 10. A method for forming an attachment device on a dental surface,
2 said method comprising:

3 providing a template which is removably positionable over at least one
4 dental feature, wherein the template has at least one receptacle having a location and
5 shape corresponding to those of the attachment device;

6 inserting dental material into the receptacle;

7 positioning the template over the corresponding dental feature(s) of a
8 patient; and

9 polymerizing the dental material,

10 whereby an attachment device is formed on the dental surface.

1 11. A method as in claim 10, wherein the polymerizing step comprises
2 bonding to the dental feature.

1 12. A method as in claim 10, wherein the polymerizing step, comprises
2 hardening of the dental material but not bonding the material to the dental feature.

1 13. A method as in claim 10, wherein the template comprises a multi-
2 tooth template which is positionable over multiple dental features so that multiple
3 attachment devices can be formed on one or multiple dental features

1 14. A method as in claim 10, wherein the template comprises a single-
2 tooth template which is positionable over one dental feature so that at least one
3 attachment device can be positioned on one dental feature.

1 15. A method for bonding an attachment device to a dental surface,
2 said method comprising:

3 providing an attachment device having a bonding surface thereof;

4 providing a template which is removably placeable over at least one dental
5 feature,

6 inserting the attachment device into a receptacle in the template; and

7 positioning the template over the dental features of the patient with an
8 adhesive between the bonding surface and the surface of the dental feature;

9 whereby the attachment device is bonded to the surface of the dental
10 feature by means of the adhesive.

1 16. A method as in claim 15, wherein the adhesive is initially present
2 on the bonding surface of the attachment device.

1 17. A method as in claim 15, further comprising applying the adhesive
2 to the dental feature.

1 18. A method as in claim 17, wherein the adhesive is applied prior to
2 positioning the template.

1 *5/25* 19. A method for moving teeth, said method comprising:
2 securing an attachment device on a dental feature; and
3 removably positioning a first dental positioning appliance over the dental
4 feature wherein the appliance comprises an elastic polymeric shell having a cavity which
5 receives the dental feature and a receptacle which receives the attachment device.

1 20. A method as in claim 19, wherein the appliance applies
2 repositioning force to the attachment device.

1 21. A method as in claim 19, wherein the appliance is anchored with
2 the attachment device and applies a repositioning force to another dental feature.

1 22. A method as in claim 19, further comprising removably positioning
2 at least a third dental positioning appliance over the dental feature, wherein the second
3 dental positioning appliance comprises an elastomeric shell having a cavity which
4 receives the dental feature and a receptacle which receives the attachment device, wherein
5 at least one of the receptacle and the cavity has a different configuration than that of the
6 first dental positioning appliance.

1 *5/25* 23. A method as in claim 22, further comprising removably positioning
2 at least a third dental positioning appliance over the dental feature, wherein the second
3 dental positioning appliance comprises an elastomeric shell having a cavity which
4 receives the dental feature and a receptacle which receives the attachment device, wherein
5 at least one of the receptacle and the cavity has a different configuration than that of the
6 first and second dental positioning appliances.

as
1 24. A method as in claim 23, wherein at least five dental positioning
2 appliances are successively placed over the dental feature.

1 25. A method as in claim 23, wherein at least ten dental positioning
2 appliances are successively placed over the dental feature.

1 26. A method as in claim 19, wherein the dental positioning appliance
2 applies an extrusive force to the attachment device.

1 27. A method as in claim 19, wherein the dental positioning appliance
2 applies a rotational force to the attachment device.

1 28. A dental attachment device comprising:
2 an attachment body having a base, wherein the base is mountable on a
3 dental feature and the body is suitable for receiving a removably attachable dental
4 appliance.

1 29. A device as in claim 28, wherein the attachment body comprises
2 bumps, beads, wedges, hooks, clasps, bands, brackets, buttons, snaps, springs, levers,
3 rods, tubes, coils, indents and/or other protrusions.

1 30. A device as in claim 29, wherein additional devices are used in
2 conjunction with the attachment body, comprising adhesives, flexible bands and/or
3 ligatures.

1 31. A device as in claim 30, wherein the protrusion comprises a
2 structure protruding perpendicularly from the surface of the dental feature, said structure
3 having a geometry which engages a feature in the dental positioning appliance.

1 32. A device as in claim 31, wherein the structure includes a sloping
2 angle of less than 90 degrees from the surface of the dental feature to the opposing end of
3 the protruding structure to aid in positioning the appliance.

1 33. A device as in claim 28, wherein the attachment device includes at
2 least one layer of a polymeric material having a first state where the device does not
3 conform to the surface of a dental feature and a second state where the device conforms to
4 the surface of a dental feature.

1 34. A system for moving teeth, said system comprising:
2 a dental positioning adjustment appliance comprising an elastic polymeric
3 shell removably placeable over at least one dental feature; and
4 an attachment device mountable on the dental feature,
5 wherein the appliance engages the attachment device when the appliance is
6 positioned over the dental feature to assist in dental repositioning.

1 35. A system as in claim 34, wherein the appliance and at least one
2 attachment device are configured to provide intrusive forces on a dental feature which is
3 free from attachment devices.

1 36. A system as in claim 34, wherein the appliance and the attachment
2 device are configured to provide extrusive forces on a dental feature upon which the
3 device is mounted.

1 37. A system as in claim 34, wherein the appliance and the attachment
2 device are configured to provide rotational forces on a dental feature upon which the
3 device is mounted.